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THE AMERICAN JACKKNIFE CLAM *ENSIS DIRECTUS*  
(CONRAD, 1843)<sup>(1)</sup> IN EUROPE (\*\*)

KEY WORDS: Bivalvia, Solenidae, *Ensis directus*, Europe.

**Summary**

In 1979 the American Jackknife Clam *Ensis directus* (CONRAD, 1843) was discovered in Europe, in the German Bight (North Sea). Since then, this East American species has enlarged its range from there to the north and the west and is now distributed in Europe from Gammelgab (Denmark) to the Balgzang (The Netherlands).

The species seems to become an integrated part of the European fauna.

The species looks most like *Ensis arcuatus* (JEFFREYS, 1865), but especially some internal muscle scars (see fig. 2, nrs. 1, 3, 4 and 5) serve to distinguish both species.

**Riassunto**

Nel 1979 il bivalve americano *Ensis directus* (CONRAD, 1843) fu segnalato in Europa, nel Mare del Nord, presso le foci dell'Elba, in Germania. Da quell'epoca la specie ha esteso la sua area di diffusione sia verso nord che verso ovest e, attualmente, è distribuita da Gammelgab (Danimarca) sino a Balgzand (Olanda), venendo evidentemente a far parte della malacofauna marina europea.

*E. directus* è apparentemente molto simile a *E. arcuatus* (JEFFREYS, 1865), ma si può distinguere da questi per la forma e disposizione di alcune impronte muscolari (si veda la fig. 2, n. 1, 3, 4, 5).

The American Jackknife Clam *Ensis directus* (CONRAD, 1843) was recorded in European waters, for the first time in June 1979, when juvenile shells were collected by grab sampling in the German Bight (VON COSEL et al., 1982).

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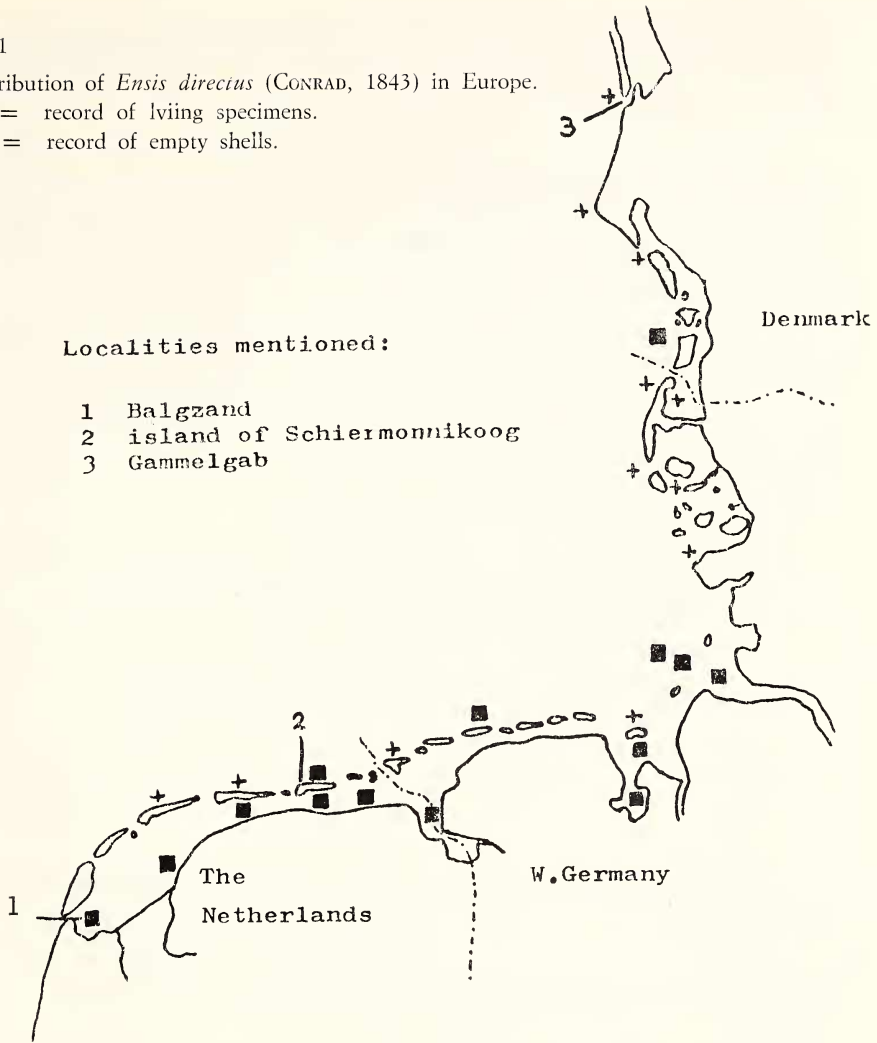
(1) According to VAN URK (1972:135) *Ensis directus* (CONRAD, 1843) is an incorrect name. In his opinion the species should be named *Ensis americanus* (BINNEY, 1870), *E. directus* being a specifically different Miocene species from North & South Carolina & Virginia.

fig. 1

Distribution of *Ensis directus* (CONRAD, 1843) in Europe.

■ = record of living specimens.

+ = record of empty shells.



Since then, this species has been reported from the Balgzand (The Netherlands) to Gammelgab (Denmark) (fig. 1). In this area the species has been found living in sandy bottoms as well as in more muddy areas; some populations living just above, other below low tide mark to a depth of 13 metres. Besides it is the only *Ensis* species living in the brackish water areas of the Waddensea.

Empty shells are found washed ashore from Terschelling (The Netherlands) to Gammelgab (Denmark); sometimes in quite large numbers. At the island of Schiermonnikoog (The Netherlands) for instance, it is at present a common shell on the beach, nearly always very fresh and with both valves together. Also 2 adult living specimens were found washed ashore there (DE BOER & DE BOER, 1984).

The original range of *E. directus* is the east coast of North America, from Labrador to North Carolina. The species lives there from just above low tide mark to a depth of 20 to 30 metres (VON COSEL et al., 1982).

It is not clear in which way the species has reached Europe. Probably free swimming larvae have crossed the Atlantic Ocean in the ballast water tanks of a ship (VON COSEL, et al., 1982). Apparently circumstances in the German Bight were good enough for further development. At this moment the species seems to become an integrated part of the European fauna.

*E. directus* is not the first species that has enlarged its range from America to Europe: *Petricolaria pholadiformis* (LAMARCK, 1818), *Crepidula fornicata* (LINNÉ, 1758), *Crassostrea virginica* (GMELIN, 1791) e.g. did this before. Probably it is also not the last American immigrant; in 1983 another American species, the Surf Clam *Spisula solidissima* (DILLWYN, 1817) was found, still alive, at the beach of Terschelling (The Netherlands) (Doeksen, 1983).

Comparing *E. directus* with other *Ensis* species from Europe, it looks most like *E. arcuatus* (JEFFREYS, 1865). The following characteristics will serve to distinguish both species:

*E. directus* (fig. 2a)

*E. arcuatus* (fig. 2b)

- |   |  |
|---|--|
| 1. Anterior adductor muscle-scar as long as the ligament or only slightly longer.   | Anterior adductor muscle-scar more than 1½ x the length of the ligament (var. norvegica: ± 1½ x the length of the ligament). |
| 2. Foot retractor scar opposite to the insertion marking the end of the ligament.   | Foot retractor scar behind the separate ligament insertion (var. norvegica: opposite to it).                                 |
| 3. Posterior adductor muscle-scar very close to pallial sinus, nearly bordering it.   | Posterior adductor muscle-scar at about its own length from the pallial sinus.   |
| 4. Pallial sinus pointing to posterior adductor muscle-scar.  | not  |
| 5. Length-height ratio about 6 : 1.   | Length-height ratio about 8 : 1.   |
| 6. Colour greyish violet with olive green periostracum.   | Colour fleshy pink with brown periostracum.  |
| 7. Anterior adductor muscle-scar usually narrowly pointed anteriorly, more or less directed downwards.  | Anterior adductor muscle-scar moderately narrowed anteriorly, almost parallel to the dorsal shell-margin.                    |
| 8. Anterior pallial scar in young specimens markedly closer to the anterior shell-margin than the ventral pallial scar to the ventral shell-margin. | Both at about the same distance.   |

The nrs. 1 - 3 are constant and reliable, indicating the identity of the species at once. The other characters may show more or less variation, but they are useful in different situations, for instance the colour and l/h ratio when collecting on the beach or nr. 8 when dealing with young material.

*E. arcuatus* var. *norvegica*, a large, broad form northern Europe, approaches *E. directus* in external appearance, compare 1 & 2, but otherwise its internal characters are those of *E. arcuatus*.

It should be mentioned, that in the Mediterranean *E. arcuatus* has only been recorded in a few specimens from the Málaga - Algeciras region up till now.

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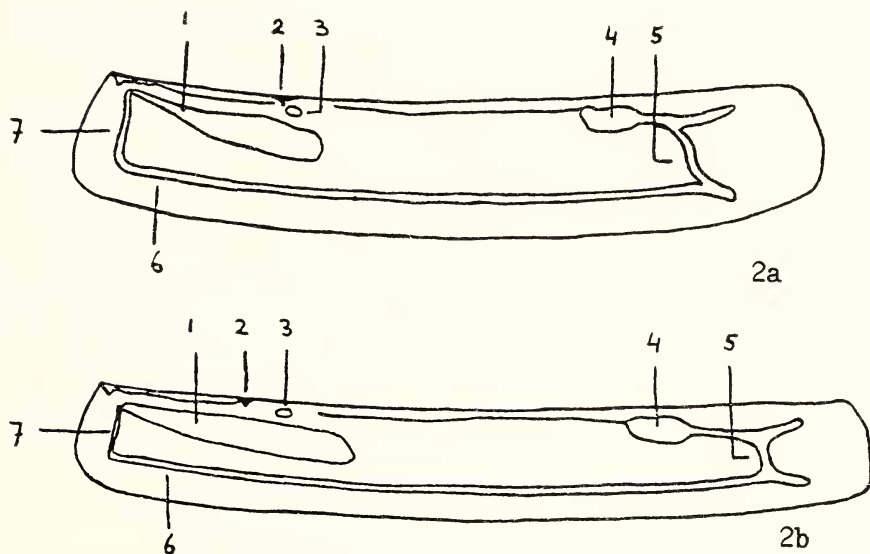


fig. 2

Interior of a: *Ensis directus* (CONRAD, 1843)

b: *Ensis arcuatus* (JEFFREYS, 1865)

- 1 = anterior adductor muscle-scar.
- 2 = ligament insertion (end of the ligament).
- 3 = foot retractor scar.
- 4 = posterior adductor muscle-scar.
- 5 = pallial sinus.
- 6 = ventral pallial scar.
- 7 = anterior pallial scar.

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